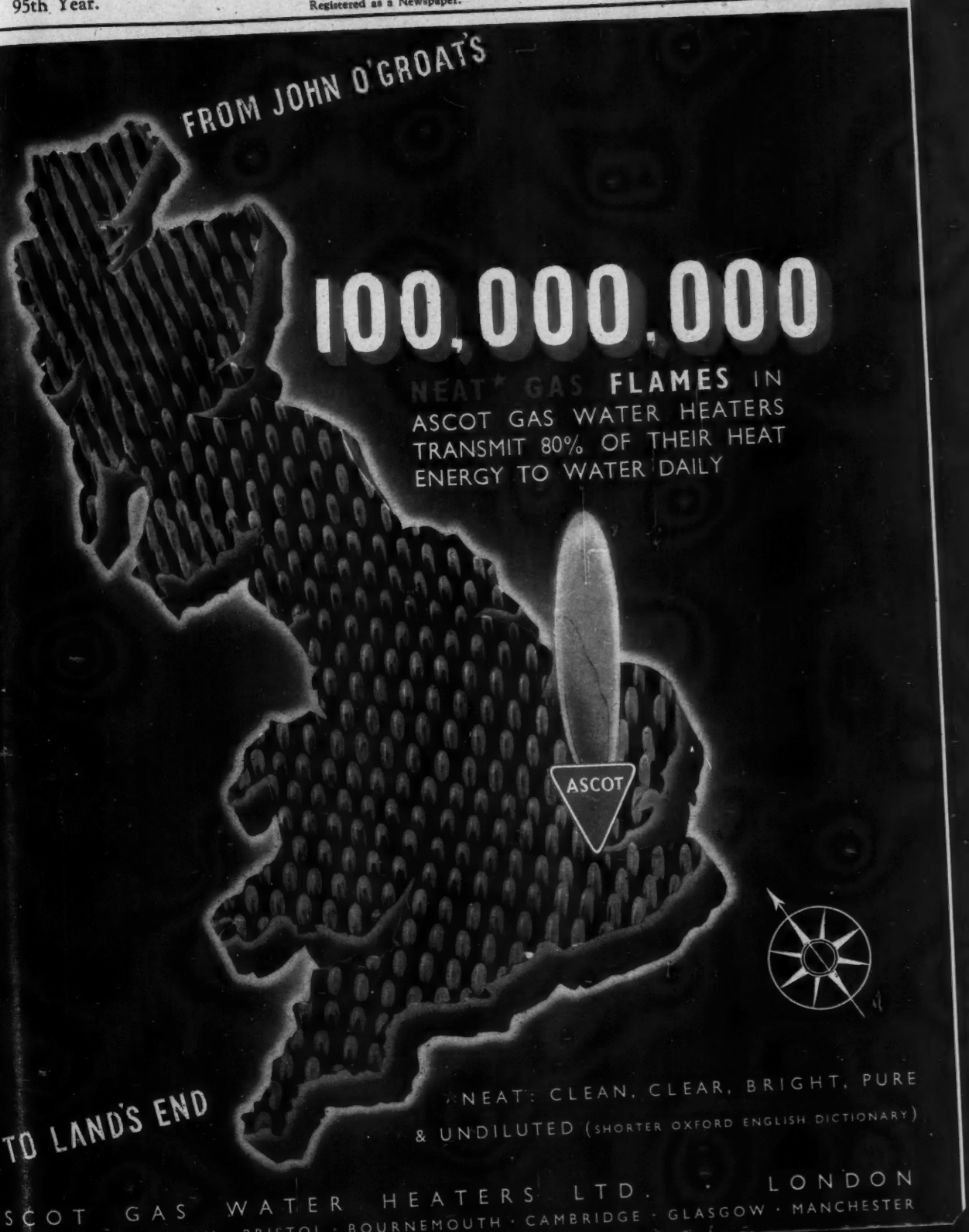
AUG 11 1943

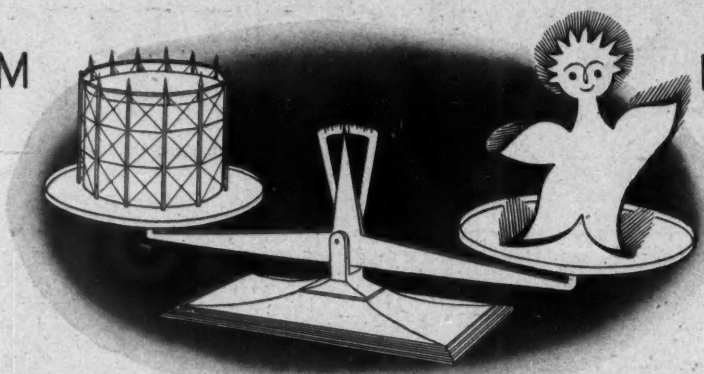
Gas Journal

LIGHT - HEAT - POWER - BY-PRODUCTS

242. 95th Year. LONDON, JULY 14, 1943. Registered as a Newspaper. No. 4182. Price 1/-


FROM JOHN O'GROATS
100,000,000
NEAT GAS FLAMES IN
ASCOT GAS WATER HEATERS
TRANSMIT 80% OF THEIR HEAT
ENERGY TO WATER DAILY
ASCOT
TO LAND'S END
NEAT: CLEAN, CLEAR, BRIGHT, PURE
& UNDILUTED (SHORTER OXFORD ENGLISH DICTIONARY)
ASCOT GAS WATER HEATERS LTD. LONDON
BRANCHES: BIRMINGHAM · BRISTOL · BOURNEMOUTH · CAMBRIDGE · GLASGOW · MANCHESTER

MINIMUM FUEL



MAXIMUM USE

OXLEY METAL SURGERY

keeps old gasholders gas tight !

The great need for economy in fuel focuses attention upon the need for adequate maintenance of gasholders to prevent loss of gas. Riveted gasholders tend to leak around loose rivets and through lap joints. Regular inspection will detect these faults—Oxley Metal Surgery can make old gasholders gas-tight and, what is equally important, the work in many cases can be executed with the gasholder in commission.

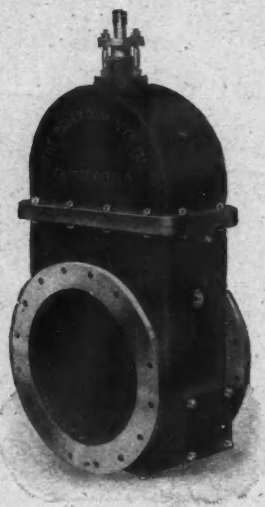
OXLEY
ENGINEERING CO. LTD.
HUNSLET, LEEDS 10
Tel.: 27468 (3 lines). 'Grams: "Oxbros, Leeds."

London Office: Winchester House, Old Broad St., E.C.2. *Telephone: London Wall 3731. 'Grams: "Asbengpro, Stock, London."*

RB W.23.

GAS VALVES

Double Faced



"HICKS" TYPE.
For medium pressures up to about 5 lb. per square inch.

These valves have the following advantages :

- Access to all working parts for cleaning while valve is under pressure.
- Spindle and nut can be renewed while valve is in position.
- The valve is of the parallel slide type and cannot jam.
- The two doors are separate and held against the faces by means of springs. The faces are, therefore, cleaned each time the valve is opened or closed.
- The valves can be provided with plugs to enable the faces and spindles to be lubricated whilst in position.
- Full clear bore.

"BAURER" TYPE.
For high pressures up to 100 lb. per square inch.

WE MAKE VALVES TO SUIT ALL CONDITIONS AND PRESSURES

THE BRYAN DONKIN CO., LTD.

CHESTERFIELD

Members of the Society of British Gas Industries

CONTENTS

EDITORIAL NOTES

A Meeting of Proprietors . . . 43
Chemical Facilities Scheme . . 43
Economics and C.V. 43
Smokeless Air Society . . . 44

Personal 44

Obituary 44
Diary 44
University of Leeds 44
Co-operation between Gas and Electricity 45
Post-War Physicists 45
Gas Oven Testing 45
The Problem of Calorific Value. By J. E. Davis, A.I.C. . . . 46
The Beveridge Report 55

Waverley Association of Gas Managers. Presidential Address of William M. Henderson 57

Gas Products Prices 58
Stocks and Shares 58

THIS WEEK'S ADVERTISERS

	PAGE
Alder & Mackay, Ltd.	59
Ascot Gas Water Heaters, Ltd.	Cover I
Aspinalls (Paints), Ltd.	S2
Bale & Church, Ltd.	59
Blakeley, Firth, Sons & Co., Ltd.	59
Bratt Colbran, Ltd.	S5
Bristol's Instrument Co., Ltd.	S4
British Flint & Cerium Manufacturers, Ltd.	41
British Gas Purifying Materials Co., Ltd.	60
Chaseside Engineering Co., Ltd.	34
Cochran & Co. (Annan) Ltd.	36
Cowan, W. & B.	Cover III
Dempster, Robert & Sons, Ltd.	59
Detel Products, Ltd.	S3
Donkin Co., Ltd. (The Bryan)	Cover II
Eagle Range & Grate Co., Ltd.	S7
Evans, Joseph, & Sons (Wolverhampton), Ltd.	Cover IV
Fluxite, Ltd.	60
Gas Purification and Chemical Co., Ltd.	59
Glover, George, & Co., Ltd.	33
Glover, Thos., & Co., Ltd.	42
Green & Boulding, Ltd.	60
Greening, N., & Sons, Ltd.	S7
Harrisons (London), Ltd	59
Harvey, G. A., & Co. (London), Ltd.	35
Holmes, W. C., & Co., Ltd.	S1
Humphreys & Glasgow, Ltd.	40
Jeavons, E. E., & Co., Ltd.	59
Keith Blackman, Ltd.	S8
King, Geo. W., Ltd.	S2
King's Patent Agency, Ltd.	59
Main, R. & A., Ltd.	54
Meltham Silica Firebrick Co., Ltd.	S3
Mewburn, Ellis & Co.	59
Mitchell, H., & Co.	S6
Morton, Joseph, Ltd.	Cover IV
Newton Chambers & Co., Ltd.	48
Oxley Engineering Co., Ltd.	Cover II
Parkinson, W., & Co.	42
Photostat, Ltd.	S2
Power-Gas Corporation, Ltd.	38
Press, William, & Son	S6
Pulsometer Engineering Co., Ltd.	Cover IV
Radiation, Ltd.	52, 53
Reavell & Co., Ltd.	S6
Sawer & Purves, Ltd.	51
Siebe, Gorman & Co., Ltd.	S6
Slingsby, Walter, & Co., Ltd.	S6
Stanton Ironworks, Ltd.	60
Strachan & Henshaw, Ltd.	33
Stringer Bros.	S3
Sutcliffe, Speakman & Co., Ltd.	39
Thomas & Bishop, Ltd.	58
Trotter, Haines & Corbett, Ltd.	59
Tully, Sons & Co., Ltd.	S6
Walker, C. & W., Ltd.	51
West's Gas Improvement Co., Ltd.	56
Wheatoe Foundry & Engineering Co., Ltd.	37
Winn & Coales, Ltd.	35
Withinshaw, A.	59
Woodall-Duckham Co.	47
Trade Cards	58
Appointments Vacant	60
Patents	59
Plant, &c.	59
Plant, &c., For Sale and Wanted	60

The "Journal" and "Salesman" office is at 51, High Street, Esher, Surrey

Communications addressed to Bolt Court have to be forwarded, and this causes delay

THOMAS GLOVER & CO. LTD.

EDMONTON. LONDON. N.18 and BRANCHES

PARKINSON

STATION GOVERNORS

STATION METERS

"POSITIVE" TYPE

W. PARKINSON & CO.

(Incorporated in Parkinson & Cowan (Gas Meters) Ltd.)

COTTAGE LANE WORKS, CITY ROAD, LONDON, E.C.1

Also at

BIRMINGHAM AND BELFAST

P.6

GAS JOURNAL, JULY 14, 1943

VOL. 242 95th YEAR No. 4182

EDITORIAL NOTES

A MEETING OF PROPRIETORS

IT is not long since we commented in these columns on what appeared to us a lack of interest on the part of the ownership of gas supply, whether private or municipal, in the affairs of the undertakings themselves and in the problems confronting the Gas Industry as a whole; and we suggested that where interest does in fact exist it all too rarely extends beyond the purely local. We were therefore gratified to hear about the step taken by the British Gas Federation in calling a meeting of gas undertaking proprietors on the advice of the Industry's Post-War Planning Committee. The meeting is to-morrow afternoon at the Central Hall, Westminster, and Sir David Milne-Watson will be in the chair. The calling of such a meeting—and we hope there will be a packed house—is in itself a matter of importance, rendered the more important on account of the nature of its purpose, which aims at arriving at a general expression of view by the proprietors on the post-war planning of the Gas Industry so far as it affects questions of ownership. It is common knowledge that the Post-War Planning Committee has issued its first draft report, copies of which have been circulated to the districts for consideration, discussion, and suggestion; no doubt there will be a considerable body of comment, and in its final form the report should reflect as far as possible an agreed view. Now the purpose of the meeting is in no sense to discuss the whole of the report; it is, as we have said, specifically concerned with questions of ownership. It is not for us to anticipate in any way what line the discussions will take, but the meeting, we trust, will provide stimulus to ownership's active interest and collaboration in a national as distinct from purely local way in future Gas Industry development.

CHEMICAL FACILITIES SCHEME

A YEAR ago, under the title " platitudinous", we commented on the Institution Paper by Mr. T. C. Finlayson on scientific control in the retort house, and we said that if the precepts be advanced—all of which were of a simple nature—were translated into fact in numerous gas undertakings in the country, the efficiency and the general tone of gas-works practice would be greatly improved. We said, too, that it was platitudinous to state that the first step in scientific control in the retort house is to provide adequate technical supervision, and on the question of cost we underlined as example the fact that on a carbonizing plant making a million cubic feet of gas a day for 250 days a year the cost of a technical assistant at £350 a year is recovered if his work leads to an improvement in the gas yield of 1 therm per ton of coal accompanied by a reduction in the producer fuel consumption of 0.1 cwt. per ton of coal carbonized. We recall Mr. Finlayson's useful practical suggestions put forward a year ago when we think of Mr. C. F. W. Rendle's contribution at this year's Institution meeting. Mr. Rendle dealt with the work of the Midlands Gas Engineering Advisory Board, whose activities had such a sterling foundation in the area's mutual aid scheme, which is well known and of which we have written appreciatively in these columns. The first step taken was to assess the carbonizing and overall efficiencies of the undertakings in the area, and, to quote Mr. Rendle, "it soon became obvious that efficiency in gas-works processes goes hand-in-hand with technical control of processes." Yet, some 40% of the gas undertakings—and this percentage is not represented solely by the smaller works—employ no technical personnel whatsoever; and this percentage is increased to between 50 and 60 if we include undertakings which employ only a "general purpose assistant" as their sole staff for chemical testing and control. The while, of course, the Industry is anxious to recruit young men of ability imbued with ambition and enthusiasm. Obviously, unless there is considerable change of outlook, the anxiety will remain and we shall have much food for thought amid fruitful discussion. And the Midlands area, we are sure, is quite advanced when we consider the Gas Industry as a whole.

Anyway, the Midlands area did get a move on and did give a lead, to good purpose, we believe, and working on truly co-operative lines. It set about to provide chemical and physical testing facilities. A scheme was evolved employing mobile caravan laboratories and apparatus cars, a central laboratory, and district base laboratories—and the facilities of the scheme can be enjoyed for a daily fee of an economic order. The scheme has been welcomed; we hope it will prove helpfully disruptive of what Mr. Rendle described as a state of affairs indicating an attitude of "complacent disregard, of procrastination, and of the absence of the urgent pursuit of an ideal"—which seems to us to savour somewhat of castigation, and we would emphasize that his comments were concerned not only with small undertakings. The Midlands mutual aid scheme has shown clearly enough that economies can be effected in undertakings which on the face of it are working efficiently; and to our mind the few words the Author devoted to this aspect in his compact Paper are very important indeed; they related to works with plant in "excellent condition, well operated on sound lines with proper technical control," where economies in fuel usage have been made simply, without difficulty. And we would mention that 1% of coal saved in gas-works in the Midlands represents 25,000 tons a year; in other words, adequate capital for a chemical facilities scheme, the possibilities of which stand out a mile. Introducing his contribution at the Institution meeting Mr. Rendle suggested that any scheme of the nature must eventually eliminate the necessity for its existence. We think that in the meantime there is much good work to be done.

ECONOMICS AND C.V.

THE Institution Paper by Mr. J. E. Davis (both Paper and Discussion are published in full in to-day's issue) emphasizes once again the flexibility provided in balancing coke and gas demands—admirably described by Mr. Finlayson as the twin fuels—by taking advantage of processes whereby water gas is added to coal gas. Admitting that the relationship between calorific value of gas and cost is complex, the Author set out with the aid of simplifying assumptions to indicate tendencies. In his brief comments introducing the Paper Mr. Davis remarked that "statistics" implies a summing-up of something finished and complete—a sort of post-mortem. So he suggested that in his analysis of a problem involving both technical and economic factors, the expression of the relative importance of the factors by means of figures, and the deduction of

trends which arise from the interplay of these factors, "statistics" should be interpreted as "working figures" bearing in mind that we are studying something which is living and changing. We like this idea, but we would stress that even "working figures" require very careful and, incidentally, imaginative interpretation, and we are inclined to think that there may well be an element of unreliability in the application of the simplified methods advanced. They may indicate tendencies, but caution is needed if we endeavour to forecast actual costs, even approximate costs, on the lines indicated.

With existing methods of manufacture, the problem is one of comparing the relative costs of coal gas and blue water gas; and it seems to be established that if coke plus breeze can command a price per ton equal to that of coal, then the raw materials costs of the two processes are substantially similar. The method adopted by Mr. Davis is to apportion the cost of coal between the products according to their thermal yields, arriving at a net price for each of the products, the basis being equal values per therm. The fuel used is charged to the various products according to their thermal yields. We prefer the alternative methods put forward by Dr. Pexton at the meeting; and we would emphasize that the price of each commodity—gas, coke, tar, benzole—must essentially be determined by its usefulness to the community. This "usefulness" factor, again, depends on a variety of important factors. For example, the "usefulness" of coke to the community is related to our outlook on its value and the policy we adopt in its manufacture and its marketing. That is why we have said that even working figures need imaginative treatment, for, through policy, working figures can be made to change.

Turning from the general to the particular, we would call attention to a specific point mentioned by Mr. Finlayson in the discussion as indicating the danger of over-simplification. He was referring to the Author's assumption that the therms of gas plus coke remain constant over the range of calorific values between 500 and 350 B.Th.U. Such an assumption necessarily involves blue water gas production at a thermal efficiency of substantially 100%.

Mr. Davis takes, with gas of 500 B.Th.U., a production of 76 therms of gas and 10 cwt. of coke per ton of coal carbonized; with 400 B.Th.U. gas, 122 therms of gas and 6.7 cwt. of coke. We calculate, therefore, that the Author counts on getting 280 therms of blue water gas per ton of coke, the calorific value of which is 280 therms per ton. But, in the tests on blue water gas manufacture carried out by Dr. Dent, the best results he obtained with a plant self-contained in steam were equivalent to 175 therms per ton of coke, representing an efficiency of 62%. In practice, over the range 500–350 B.Th.U. the therms of gas plus coke show a progressive drop as the calorific value of the gas falls. Hence our suggestion that the assumptions made in the Paper imply that the figures are indicative of broad tendencies only.

Finally, we would call attention to the remarks by Mr. Finlayson on the fact that no opportunity has yet been afforded to members of the Institution to debate the findings of the four Committees of Enquiry of the Institution on calorific value, coke, sulphur, and standardization. Expressing puzzlement—a bewilderment which we ourselves have previously recorded—he asked whether this lack of discussion was because the reports are regarded as *sub judice*, subversive, subnormal, or sublime.

Smokeless Air Society?

At a meeting of the West Riding of Yorkshire Regional Smoke Abatement Committee an Address was given by Mr. Arnold Marsh, General Secretary of the National Smoke Abatement Society, in which he made the point that the smoke abatement movement has developed a policy far more ambitious, and yet also more concrete, than anything it has had in the past. The time for bold and vigorous action is coming, and the end of the war must see the opening of a determined campaign to secure not smoke abatement, which implies a mere alleviation of the evil, but smoke abolition. Smoke abatement is, in fact, dead. In its place there is a movement for the complete ending of smoke and other forms of air pollution based upon the knowledge that it is now technically possible as well as socially desirable. A sign of this is the growing demand among its members that the National Smoke Abatement Society should delete "abatement" from its title and employ instead the word "prevention" or "abolition." Mr. Marsh suggested that "smokeless air" would be nearer the mark—the Smokeless Air Society, for example, and the West Riding of Yorkshire Regional Committee for Smokeless Air.

Personal

Mr. GEORGE BRIGGS, Secretary and Manager of the Knutsford Light and Water Company, has been elected President of the Knutsford Rotary Club.

* * *

Mr. RAYMOND WILSON, Shift Engineer to the City of Salford Gas Department, has been appointed Second Assistant Engineer to the County Borough of Burnley Gas Department. Mr. Wilson, prior to his appointment at Salford some two and a half years ago, had experience in the coke oven industry in the Chesterfield area.

* * *

As from July 1 Mrs. L. CRAWSHAY took over the office of Secretary of the Southminster Gas Company. The former Secretary, Mrs. L. J. WARNES, has joined the Forces, and the Assistant Secretary, Miss R. HEBDEN, has retired.

Obituary

The death has occurred of Mr. G. W. MITCHELL, who had been a Director of Manchester and Sheffield Tar Works Company, Ltd., and of Ellison & Mitchell, Ltd. When these businesses became incorporated in Yorkshire Tar Distillers, Ltd., 16 years ago, he joined the Board of that Company, and subsequently the Executive Committee. He was particularly identified with the road-dressing materials trade of the company.

* * *

The death occurred on June 28 of Mr. HAROLD HIGHAM, Engineer, Manager, and Secretary to the Teignmouth Gas Department since 1918.

* * *

The death has occurred of Mr. JAMES H. LAMONT, founder of Messrs. James H. Lamont & Co., Ltd., and, until recently, Managing Director.

Diary

July 19.—London and Counties' Coke Association Committees: Finance, 11 a.m.; Executive, 11.30; Central, 2 p.m.

July 20.—British Standards Institution, Annual General Meeting, 3 p.m., Connaught Rooms, Kingsway, W.C. 2.

July 29.—Association of Gas Corporations: 2 p.m., Finance Sub-Committee; 2.30 p.m., General Purposes Committee; 3.30 p.m., Council; 2, Chart Lane, Reigate.

University of Leeds

The following Examination Results in the Department of Coal Gas and Fuel Industries, Leeds University, are announced:

D.Sc.—**Stuart Pexton** (Research Laboratory, Fulham, Gas Light & Coke Co.) for a thesis on "Developments in the Science of Coal Carbonization and Recovery of By-products."

Ph.D.—**Edgar Heaton** for a thesis on "The Constitution of British Refractory Clays"; **C. B. Marlinkov** (British Council Scholar), for a thesis on "High Temperature Oxidation of Steel and Cast Iron."

M.Sc.—**N. Y. Kiroff** (British Council Scholar) for a thesis on "Industrial Fuel Problems under Wartime Conditions"; **M. S. Wang** for a thesis on "The Intercrystalline Penetration of Molten Alloys into Steel."

The Kilbarchan Gas Undertaking, Renfrewshire, has been acquired by the Johnstone Corporation Gas Department from the Caledonian Gas Corporation, Ltd. The Kilbarchan area will be supplied direct from Johnstone, and an immediate reduction of 7d. per 1,000 cu.ft. on the price of gas has been made.

David Grant & Co., Ltd., 39, East Crosscauseway, Edinburgh, has been registered. Capital, £25,000 in £1 shares. Private company to adopt and carry into effect the agreement of sale of the business of David Grant & Co., gas meter manufacturers, and carry on the business of iron and brass founders, &c. Directors: James M. Thomson, W.S., Joseph L. Bennet, Stanley Bennet, and James O. Scott.

Co-operation Between Gas and Electricity

Speaking at the annual general meeting of the Incorporated Municipal Electrical Association recently the President (Mr. F. Newey, City Electrical Engineer, Lincoln) said the Minister of Fuel had recently made suggestions that more co-operation between the gas and electricity interests would be necessary in the post-war period, and this pronouncement had caused no little concern in many directions. Why electricity supply authorities should be alarmed at this statement was not clear. So far as he was aware there had been no criticism of the conduct of the electricity supply industry—in fact, all evidence went to prove that very rapid development would take place in the immediate post-war years. The various reports issued on post-war development stressed the need for an adequate supply of electricity, particularly in the rural areas, with the same facilities as those enjoyed by people in the urban areas.

They had been told by the Minister that the consumer must be allowed to choose electricity or gas. If this were true, what had the electricity supply industry to fear? During the past 20 years the public had made their choice and the rapid development of the electricity supply industry was the answer. The great convenience of electricity made it a necessity in every home and a supply would be essential in all new houses built in connexion with the post-war schemes. The electrical requirements of domestic consumers would be greatly increased as a result of wartime development; therefore, any co-operation with gas must be found in other directions. Everybody agreed that the nation's coal must be preserved, and here electricity was making a substantial contribution to the full utilization of water power. It was generally admitted that by-products of coal should be utilized to the full, but the very inferior coal used in most generating stations was incapable of use in any other way. Indeed, this inferior coal must be removed from the pits to enable the better coal to be taken out. Coal consumption in the electricity supply industry had been reduced from 3½ lb. to 1½ lb. per unit. Has any other industry such savings to its credit?

In these circumstances how, then, was co-operation possible? The answer surely was with the Gas Industry, who must provide the electrical industry with heat units at the right price. The Gas Industry must encourage research into the production of an efficient and reliable gas turbine or other means of generating power. The electricity supply industry must have economic prime movers—they only required mechanical energy at no greater "all-in" cost than modern steam turbine with expensive boiler plant. It was up to the Gas Industry to supply the power at the right price with the same degree of reliability and maintenance costs as the present plant.

It had been stated that the electricity supply industry was a young industry. The I.M.E.S., had been in existence some 48 years; it was not quite an infant, and the development of the electricity supply industry had stimulated progress in many directions. Approximately £1,000,000 a year was being spent by the industry on research and development. Confidence and competition were essential if efficiency and progress were to be maintained. The enormous expenditure by electricity supply authorities on development of all kinds had brought a great reward to the nation in the more efficient utilization of natural resources by many other industries, in addition to electricity supply. Gas undertakings were large users of electricity and in this way there was co-operation. The electrical industry would gladly become large users of gas if this became the most economical way in which to produce electricity.

Post-War Physicists

The Board of the Institute of Physics has issued a Report on the "Education and Training of Physicists," prepared by a Committee under the Chairmanship of Sir Lawrence Bragg, member of Council of the Gas Research Board. The central theme of the report is the necessity for a physicist to have a broad education so that he may be fitted both for co-operation in a team and for leadership in posts of high responsibility.

The present scholarship system is criticized and its replacement, in general, by a modified system of State Bursaries recommended. The spending of all three years of undergraduate study in an Honours School of Physics to the virtual exclusion of other sciences is considered to be undesirable specialization, and a general course in science is recommended as the normal University prelude to an intensive study of physics. Another recommendation is that arrangements should be made for post-graduate courses both on the theoretical and experimental side of physics.

An increased study of English language and literature is strongly urged, while a knowledge of foreign languages is also considered to be a normal part of a research physicist's equipment.

The report stresses the important functions of the technical colleges which, it maintains, must be kept distinct from those of the Universities. The adoption of a State Bursary Scheme, whereby all showing sufficient ability to profit by it, irrespective of private means, will be able to receive a full-time University education will, the Committee hopes, enable the technical colleges to concentrate on their special activities by relieving them of the necessity of preparing students for external University degrees. It is recommended that the technical colleges should provide courses in branches of technical physics on the lines of those for National Certificates and Diplomas and that students who take these should be enabled to obtain some recognized professional qualification in physics.

The Committee considers that many students of physics would benefit from some direct contact with industry as part of their training; but, "thinks it inadvisable to prescribe which of the ways of doing this is the best solution, as so much depends on the character of the student and the facilities available."

Gas Oven Testing

British Standard No. 1115 details physical, chemical and practical tests by which domestic gas ovens may be proved and differentiated. Some of these tests—*e.g.*, that for hygienic efficiency—have had previous currency, but are here in form revised as the result of experience; others are new, called into being to meet the progress of the last decade before the war when strides were made in design and construction and in the adoption of auxiliary appliances such as thermostats. The range of practical cooking tests is particularly comprehensive, and reflects the greatly improved quality of output fostered by the improved ovens and now demanded as "standard" by the user.

The first issue of a connected series of oven tests was that made in a report by The Institution of Gas Engineers some nineteen years ago, and it is good to learn that report retains value and is referred to here.

The B.S.I. has had the collaboration of technicians, chemists, and demonstrators representing the Gas Industry and the gas stove industry in preparing this present B.S., copies of which can be obtained from the British Standards Institution, 28, Victoria Street, S.W. 1, price 2s. post free.

The Boston Gas, Light and Coke Company are notifying their consumers that, as from Oct. 1, it is their intention to supply gas of a calorific value of 500 B.Th.U. per cu.ft. The main reason for the change is to improve the distribution in the outlying parts of the town and in the rural district.

Dividends have been declared as follows by the Yorktown (Camberley) & District Gas & Electricity Company in respect of the half-year ended June 30: 5% Consolidated Preference Stock at the rate of 5% per annum; 4% Redeemable Preference Stock 1963/1968 at the rate of 4% per annum; 5% Standard Consolidated Ordinary Stock at the rate of 5½% per annum; all less income tax.

Keith Blackman, Ltd.—An Ordinary dividend of 20% (same as last year) was declared at the 53rd annual meeting at Tottenham on June 30. The accounts showed a profit for the year ended March 31, 1943, after charging all expenses and making provision for depreciation, directors' fees, &c., of £149,601. Taxation reserve took £96,080, deferred repairs £10,000, and reserve account £15,000. Mr. George Keith, Chairman and Managing Director, said the sincere thanks of the Company were due to the management, staff, and workers for their splendid service during the year; the Directors' appreciation was expressed in practical form by granting them bonuses as in former years. While the Company was concentrating on present-day requirements it was not unmindful of the post-war problems which awaited it, and which would be faced with confidence. The experience gained during the difficult war period would, he was sure, help them successfully to meet and overcome them.

Under War Conditions it is necessary, on occasion, to utilize coke or anthracite in boiler plants which have previously burned coal. This, as indicated by the Ministry of Fuel and Power, involves some differences in operation, due mainly to the variations in the amount of volatile matter in the three types of fuel normally fired; these are approximately as follows: Coal, 30%; anthracite, 8%; coke, 1%. Owing to the comparatively small amounts of volatile in coke and anthracite, secondary air admitted above the fire can be greatly reduced. With coke, grills on the firing door should be kept closed and with anthracite they should only be open slightly. The dampers controlling the flow of air through the firebed should not be opened more than is necessary, although it may be found that owing to the slow burning qualities of coke and anthracite they may have to be opened slightly more than when coal is burned. If possible, CO_2 readings should be taken at the flue gas exit and conditions adjusted until 14 to 16% is maintained with coke and 12 to 14% with anthracite. Neither fuel should be forced to meet peak demands, so that an endeavour should be made to anticipate requirements and fires made up accordingly. Firing times also require adjustment.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

THE PROBLEM OF CALORIFIC VALUE

Institution of Gas Engineers, June 9.

By J. E. DAVIS, A.I.C.,

South Metropolitan Gas Company

It is now just two years since Sir Frederick West presented to this Institution his Paper on "The Standardization of the Declared Calorific Value*". For some time it had seemed, to say the least, untidy that there should be such a variety of declared calorific values and an analogy was sometimes sought in the standardization of frequencies found necessary by the electricity supply industry. As a direct result of the Paper and the ensuing discussion, the Council of the Institution appointed a Committee of Enquiry on Gas Quality and the Committee's Report† is now available. Whilst it makes very definite recommendations as to the permissible tolerances of deviation from a standard of quality once that quality has been selected, this Report also recommends that the existing freedom in choice of declared calorific value shall remain. This expression of authoritative opinion is of particular importance, for the Gas Industry rightly prides itself in being flexible in meeting the requirements of the public.

Towards the improvement of fuel utilization, and in the interests of smoke abolition, the Industry offers the twin fuels, gas and coke. It is too much to hope that the public demands for these two will always balance the proportions in which they are produced by straight carbonization, and it must be expected that as the use of these smokeless fuels extends in the future, the demand for one will outstrip the demand for the other. In one place it may be coke that is in greater demand; in another, gas. Fortunately, the existing processes of gas manufacture show a high degree of flexibility in suiting supply to demand, but with them all a high yield of gas means a lowered calorific value. To some extent the reduction of calorific value may be avoided by the use of oil, but the raw material costs limit the extent to which this expedient may be employed. Thus it may be said that the problem of calorific value is very largely the problem of balancing supply and demand for gas relative to coke.

Seeing that gas appliances in daily use are consuming gaseous fuels ranging in calorific value from 200 to 2,000 B.Th.U. per cu. ft. (the latter figure relates to "bottled" gas), there is little reason for doubting the ability of appliance designers to provide apparatus capable of giving efficient service at any probable level of calorific value.

Choice of Calorific Value

If the service that can be given is adequate at any selected level, the choice of calorific value must be guided mainly by the cost of providing that service. It would be idle to pretend that the relationship between calorific value and cost is a simple one, but the admission of a complex relationship is never of much practical help. While this Paper does not pretend to give a simple answer to every question or to make an accurate estimate of costs, it does seek to analyse the problem with the aid of certain simplifying assumptions and thus to indicate tendencies, the knowledge of which may be helpful.

The selection of the most appropriate calorific value of gas for supply to a particular district is influenced by so many factors, some of a purely local nature, that no universally applicable formula could be derived. Nevertheless, there are certain broad considerations which will affect all cases and, however modified in detail, will have a general application.

Gas of any given calorific value may be produced in a number of different ways and in a variety of plants. The normal type of gas will, however, approximate to a mixture of coal gas and blue water gas. By increasing the proportion of blue water gas the calorific value may be lowered progressively until a figure of 350 B.Th.U. per cu. ft. is reached. At this point all the coke made will have been used in the production of water gas and there will be none for sale. Gas of 300 B.Th.U. per cu. ft. may be regarded as blue water gas alone. Below this figure, reduction of calorific value must involve the admixture of non-combustible gases and these may be regarded as having the composition of blow gases. By looking at the question in this manner it is possible to ignore the type of plant used and to assume only that the gas is made from coal and that there is no large dilution with inerts for calorific values above 300 B.Th.U. per cu. ft. The types of gases considered are shown in Table 1.

TABLE 1.—*Types of Gases Considered*

Calorific Value, B.Th.U. per cu. ft.	Per Cent Blue Water Gas	Per Cent Blow Gases	Specific Gravity
1	2	3	4
500	13	—	0·40
450	35	—	0.43
400	65	—	0·47
350	78	—	0·50
300	100	—	0·53
250	56	28	0·67
200	43	43	0·80

(The coal used is assumed to be a good Durham or Yorkshire gas coal, and benzole extraction is accepted as normal practice.)

The Effect of Calorific Value Alone

It is obvious that, all other things being equal, a lower calorific value must involve greater expense per therm in the provision of wet and dry purification plant, meters, mains, holders and distribution plant. The disadvantage may be offset wholly or partially by other factors, but before it is possible to strike a balance the magnitude of the effect must be known. The first group of items to be considered comprises the "volumetric" plant on the Gas Works, that is, those items of plant which are designed to deal with a volume of gas irrespective of its quality. They include condensers, exhausters, purification plant, meters, gasholders, governors and works mains. A normal pre-war estimate of their cost would be £32 per 1,000 cu. ft. per maximum day. Allowing 13 per cent for capital charges (5 per cent interest, 5 per cent maintenance, 3 per cent sinking fund) spread over an annual output equal to 220 days at maximum output, this represents 4·55d. per 1,000 cu. ft.

The second group of items covers distribution plant. This also has to be designed on a basis of volume handled but, in addition, is affected by the specific gravity of the gas. The Author is indebted to H. J. Escreet for a detailed calculation of the distribution and transmission plant required to supply gas to the extent of 110 therms per consumer per annum on an actual housing estate for gases of 500, 350 and 200 B.Th.U. per cu. ft. (see Table 1). Since the change in composition between these values is regular, the intervening values have been interpolated. In these figures, no addition has been made for the higher capacity meter which would, in many cases, be necessary.

Table 2 shows the effect of calorific value on these two groups of items.

TABLE 2.—*Effect of Calorific Value on Capital Charges and Distribution Costs*

Calorific Value, B.Th.U. per cu. ft.	(A) Capital Charges on Works: "Volumetric" Plant, pence per therm	(B) Distribution Costs, pence per therm	(A) and (B), pence per therm
1	2	3	4
500	0·91	1·56	2·47
450	1·01	1·69	2·70
400	1·14	1·82	2·96
350	1·30	1·95	3·25
300	1·52	2·08	3·60
250	1·82	2·38	4·20
200	2·28	2·68	4·96

Compensating Factors

While the effect of decreasing the calorific value is, in itself, bound to cause a substantial increase in the cost per therm, there are possible compensating factors which may make such a course beneficial. The capital charges for gas-making plant, the process wages and the cost of fuel used, have all to be carried by the revenue from gas, and if the yield of gas therms per ton of coal can be increased the incidence of these

* *Trans. Inst. Gas Eng.*, 1940-41, 90, 348.
† *Inst. Gas Eng. Comm. No.* 249 (1942).

charges per therm of gas may be reduced. The extent to which this benefit is realized depends upon several factors, the most important being:

(*a*) Throughput of coal in tons per unit of plant.
(*b*) Thermal efficiency of process.
(*c*) Relative prices of coal and coke.

Increased Thermal Yield of Gas

Many items of gas works plant are proportional, or nearly proportional, in cost to the tonnage of coal handled, amongst them being coal storage and handling plant, carbonizing plant, coke-handling and storage plant, power plant, tar and liquor storage plant. If the yield of therms per ton can be increased without decreasing the throughput of coal per unit of plant, the capital charges on these items of plant and the process wages are spread over a large number of therms and the incidence per therm is reduced. A normal figure for the capital cost of this plant, for 500 B.Th.U. gas, would be £8·2 per therm of maximum daily output. Taking capital charges at 13 per cent for an annual output equal to 220 maximum days, this represents 1·16d. per therm at a yield of 76 therms per ton. Process wages are taken as 0·40d. per therm. The possible magnitude of the effect of an increased thermal yield of gas accompanied by a reduction in calorific value is seen in Table 3.

TABLE 3.—*Effect of Increased Thermal Yield of Gas, with Reduction in Calorific Value*

Calorific Value, B.Th.U. per cu. ft.	Gas Yield, therms per ton	Coke Yield, cwt. per ton	(C) Capital Charges, pence per therm	(D) Wages, pence per therm	(C) and (D), pence per therm
1	2	3	4	5	6
500	76	10·0	1·16	0·40	1·56
450	92	8·9	0·96	0·33	1·29
400	122	6·7	0·72	0·25	0·97
350	216	nil	0·41	0·14	0·55
300	216	nil	0·41	0·14	0·55
250	216	nil	0·41	0·14	0·55
200	216	nil	0·41	0·14	0·55

By combining the final columns of Tables 2 and 3, there is obtained the possible effect of reduction in calorific value and increased gas yield upon total manufacturing and distribution costs (excluding net cost of coal).

TABLE 4.—*Possible Effect of Reduction in Calorific Value and Increased Gas Yield*

Calorific Value, B.Th.U. per cu. ft.	Gas Yield, therms per ton	Table 2 : (A) + (B), pence per therm	Table 3 : (C) + (D), pence per therm	(A) + (B) + (C) + (D), pence per therm
1	2	3	4	5
500	76	2·47	1·56	4·03
450	92	2·70	1·29	3·99
400	122	2·96	0·97	3·93
350	216	3·25	0·55	3·80
300	216	3·60	0·55	4·15
250	216	4·20	0·55	4·75
200	216	4·96	0·55	5·51

Practical Limitations

It will be seen that there is a possible advantage to be gained by a progressive lowering of the calorific value and an increase in gas yield, but in practice this gain may not materialize owing to a decrease in overall thermal efficiency with more complete gasification or failure to maintain the tonnage throughput of plant. E. G. Stewart* has shown to how great an extent various types of gas-making plant depart from the ideal case assumed in Table 3, with the result that in practice the full compensating effect of increased gas yield is not obtained and the cost, contrary to the indications of Table 4, increases with decreasing calorific value. The magnitude of the increase will depend upon the type of plant used, being least in the case of continuous vertical retorts.

In passing, it may be noted that there would be substantial advantage in a process by which the gas yield would be increased while maintaining the plant throughput and the calorific value, thus combining the lowest costs in cols. 3 and 4 of Table 4.

The main deduction to be drawn from these figures is that there is no intrinsic disadvantage in reducing the calorific value over the range 500 to 350 B.Th.U. per cu. ft. Below 350 B.Th.U. there is no further gain in gas yield and only the disadvantages due to the higher costs (A) + (B). This is fundamental and irrespective of the type of plant employed.

* *Gas J.*, 1942, 239, 21.

Net Cost of Coal

The next effect to be considered is that of gas yield upon the net cost of coal. This effect is not wholly straightforward, because it varies with the thermal efficiency of the process and with the relative prices of coal and coke. (The coke price referred to throughout is the net revenue for all coke and breeze after deducting the costs of preparation and selling.)

The problem may conveniently be considered in this way. A certain sum of money is paid for 300 therms in the form of a ton of coal. After processing, a smaller number of therms will be available, some as coke and some as gas or tar or benzole. If the value of the tar and benzole be deducted from the cost of coal, and thermal value of these products deducted from the total therms recovered, the residual cost of the coal has to be recovered from the sale of the number of therms recovered as coke and gas.

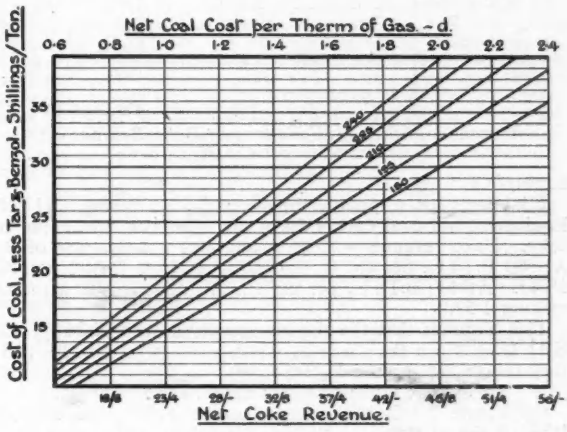


FIGURE 1.—*Method of Calculating Price of Coke at which Net Coal Costs of Gas and Coke are Equal.*

It is a simple matter to calculate the price of coke per ton at which the net coal cost per therm of gas is equal to the net coal cost per therm of coke. When this position exists it is immaterial to the net coal cost per therm of gas whether much or little of the recovered therms appear as gas or as coke. Figure 1 gives a simple means of ascertaining this figure, the sloping lines indicating the total number of therms recovered as coke and gas.

Usually, the revenue from coke will not be that found from Figure 1, but something either more or less. If there is a deficiency in coke revenue the net coal cost per therm of gas will be increased, and the amount of the increase will vary according to the relative number of gas therms and coke therms. With fewer coke therms and more gas therms there will be a smaller total deficiency and a large number of gas therms over which the deficiency can be spread. The effect of a surplus or deficiency in coke revenue can be obtained from Figure 2. While Figure 2 is applicable to the "fatter" gas coals it would need to be re-drawn for "leaner" coals. The horizontal calorific value scale is, in effect, a scale of gas : coke ratios.

Some examples of the use of these graphs may be helpful.

Example 1

Coal costs 18s. per ton and the gas and coke therms total 240. From Figure 1 the equivalent net coal cost is 0·90d. a therm of gas and 21s. a ton of coke. The net revenue from coke is 22s. a ton, i.e., a surplus of 1s. From Figure 2 a surplus of 1s. in coke price with 500 B.Th.U. gas reduces the net cost of coal per therm by 0·08d., giving a figure of 0·90d. — 0·08d. = 0·82d. per therm. At lower calorific values the advantage would be less and the manufacture of a high calorific value gas is indicated.

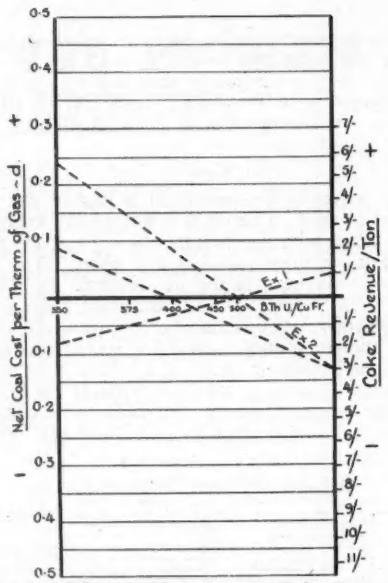


FIGURE 2.—*Effect of Variations in Coke Revenue on Net Coal Cost.*

Example 2

Coal costs 30s. a ton and the gas and coke therms total 240. Equivalent net coal cost, 1·5d. a therm of gas, 35s. a ton of coke. Coke revenue = 32s. a ton, i.e., a deficiency of 3s. At 500 B.Th.U. per cu. ft., this adds 0·24d. a therm, making 1·74d. At 400 B.Th.U. per cu. ft., this adds 0·09d. a therm, making 1·59d.

This assumes that the therms recovered when making 400 B.Th.U. gas are the same as when making 500 B.Th.U. If they fall to 225, Figure 1 gives:

Gas 1·6d.: Coke, 37s. 4d.; a deficiency of 5s. 4d.

On Figure 2 this deficiency means + 0·16d., or a total of 1·76d. a therm.

Thus it would still be worth reducing the calorific value even though the thermal yield fell by this amount, particularly as the smaller coke yield might bring in a better price per ton.

If the thermal yield fell to 210, the net coal cost would become 1·72d. for gas and 40s. 2d. for coke. The coke deficiency is then increased to 8s. 2d. and the extra gas cost to 0·25d., making 1·97d. This sacrifice in thermal yield could not be justified. It would, however, be worth lowering the calorific value to 350 B.Th.U. per cu. ft. even though the thermal yield fell to 210 therms of gas and coke per ton.

It needs to be repeated that the Figures 1 and 2 are in no sense intended to act as ready-reckoners. The purpose is to help in the analysis of the problem of calorific value and to show the tendencies that follow from changes in such prime factors as coal cost and coke revenue.

It still remains true that the cheapest gas is made when coal is cheap and the revenue from coke is high, but it is not completely within the Industry's power to ensure that such circumstances shall always obtain. If the demand for gas exceeds that for coke there may be a real advantage in selecting any appropriate calorific value in the range 350 to 500 B.Th.U. per cu. ft. There is no advantage gained, and much is lost, by reducing the calorific value with non-combustible gases, and since these must be employed to obtain values below 350 B.Th.U. per cu. ft., this figure would seem to be the minimum that can be justified.

From Figure 1 it is seen that the higher the price of coal becomes, the greater is the premium that must be obtained in coke revenue if the equivalent net coal costs for gas and coke are to balance. It is likely that this coke revenue will be difficult to attain, in which case the general effect of high coal prices will be to make a reduction in declared calorific value desirable.

High thermal yield is an important factor in producing cheap gas, yet it may well be worth sacrificing total thermal yield in order to combat low coke revenue.

Finally, this analysis shows the direction in which methods of coal processing need to be modified as demands for gaseous fuel increase.

DISCUSSION

Mr. T. C. Finlayson: In his introductory paragraph Mr. Davis draws attention to the recommendation of the Gas Quality Committee that the existing freedom in choice of declared calorific value shall remain, and it is upon this premise—with its consequent effect on flexibility of gas production methods—that the rest of the Paper depends. The Author is good enough to label the Report on Gas Quality as being "an expression of authoritative opinion," and in passing I would like to express some puzzlement and even some regret that no opportunity has yet been afforded to members of the Institution to debate the findings of the four Committees of Enquiry. I cannot make up my mind whether this is because the reports are regarded as being *sub judice*, subversive, subnormal, or sublime.

As I have said, the main theme of the Paper is to draw attention to the flexibility which is provided in balancing coke and gas demands—the twin fuels—by taking advantage of processes whereby blue water gas is added to coal gas. If Mr. Davis will allow me to say so, his pronouncement will give more pleasure to some of us than if it had been made by ninety and nine other gas engineers.

In his Paper Mr. Davis states that the relationship between calorific value of gas and cost is complex, and he then sets out with the aid of certain simplifying assumptions to indicate tendencies. He is to be congratulated on the ingenuity and originality of his simplification procedure, and as long as the purpose of such simplification is merely to indicate tendencies, a useful purpose is served, but as a means of forecasting cost of gas production under any particular circumstances, the simplified methods tend to be unreliable. Tedious though it may be, there appears to be no reliable short cut to the determination of an accurate cost of gas production than by the working out of the actual figures, taking into consideration type of plant, calorific value of gas, coal quality, scale of operation, and so on.

The difficulty with which Mr. Davis was faced in attempting simplification can be illustrated by reference to Table III. The basis of this table is that the yield of therms per ton of coal can be increased over wide limits without decreasing the throughput of coal per unit of plant. As Mr. Davis knows, this is highly improbable, but the further complication is that the effect varies with different types of carbonizing plant. This table also introduces a further instance of what appears to me to be over-simplification, namely, that the therms of gas plus coke remain constant over the whole range of calorific values from 500–350 B.Th.U. In order to obtain this, it involves blue water gas production at an efficiency of substantially 100%. In practice it is suggested that over the range 500–350 B.Th.U. the therms of gas plus coke show a progressive drop as the calorific value of the gas falls. Only on the theoretical assumption that coke can be converted into gas at an efficiency approaching 100%, can it be said that it is immaterial to the net coal cost per therm of gas whether much or little of the recovered therms appear as gas or coke.

To sum up, it appears to me that it is impossible to prepare simple diagrams of the type of figs. 1 and 2 without making such assumptions as will mean that the figures are indicative of broad tendencies only. Having studied the broad tendencies, actual costs relating to the specific case under examination should be worked out before coming to any conclusion. In general, Mr. Davis seems to confirm the view of the Gas Quality Committee that they did not find, over wide limits, that gas of any particular calorific value is generally the most economical to supply.

Dr. S. Pexton (Gas Light and Coke Company): Mr. Davis rightly defines the "Problem of Calorific Value" as one of balancing the relative proportions of gas and coke for sale. With existing methods of manufacture, the problem becomes, therefore, one of comparing the relative costs of coal gas and blue water gas. If coke plus breeze can command a price per ton equal to that of coal, then the raw materials costs of the two processes are substantially similar. The fundamental reason for this was given by Mr. Birks in the discussion of a paper by Dr. Smith at a recent meeting of the London & Southern District Junior Gas Association, namely, the therms per ton of net material consumed by the two processes are almost identical. For example, 80 therms of gas (including benzole) are yielded by 1 ton of coal minus 0.5 tons of coke (including breeze) minus 0.05 tons of tar = 0.45 tons of net coal substance consumed or 178 therms of gas per net ton of coal consumed substance. Dr. Dent's survey of the water gas process showed 175 therms of blue water gas per ton of coke when the plant was self-supporting in steam.

The difficulty of balancing coke stocks, however, does not obtain under average conditions, but only periodically when there are disproportionate demands of coke relative to gas, *e.g.*, in summer compared with winter. Encouraging consumers to purchase their winter stocks of coke in summer is helpful but hardly eliminates the problem. I should like to suggest that it might be in the interest of the community if an undertaking had Statutory Powers to sell its gas from April to November—say, three-fifths of its annual output—at a calorific value of 450 B.Th.U. per cu.ft., and the remainder during December to March at a calorific value of 500 B.Th.U. per cu.ft., and charging a uniform price per 1,000 cu.ft. The relative periods at the different values would be subject to slight adjustment to enable the total annual output to have an average declared value of 470 B.Th.U. per cu.ft. Apart from reducing the amount of coke to be stocked in summer this procedure would enable an undertaking, which meets its

peak load with carburetted water gas, to provide a gas supply of much more uniform combustion characteristics.

Mr. Davis has outlined a method of apportioning the cost of coal between the products according to their thermal yields, thus arriving at a net price for each of the products, the basis being equal values per therm. For example, with coal at £2 per ton, the cost of the coal is apportioned as follows:

	£ s. d.	Pence per therm of each product.
80 therms of gas (including benzole) } — $\frac{80}{240} \times £2$ =	13 4 =	2.0
20 therms of tar 11 galls. do. } — $\frac{20}{240} \times £2$ =	3 4 =	2.0
140 therms of coke and breeze 10 cwt. do. } — $\frac{140}{240} \times £2$ =	1 3 4 =	2.0
240 therms of product ... =	£2 0 0 =	2.0

Coke and breeze £2 6s. 8d. per ton.

The 60 therms of fuel used (and unaccounted for) have thus been charged to the various products according to their thermal yields.

The following alternative methods, however, seem to me to be more in accord with current practice:

1 ton of coal (300 therms) at £2 = 1.6d. per therm.

The Efficiency of Gas Production

$$\frac{80}{80 + 60} \times 100 = 55.6$$

Each therm of gas (including benzole) costs in raw materials $\frac{1.6}{0.556}$ = 2.8d. per therm.

The cost of coal is then accounted for as follows:

	s. d.	Pence per therm.
80 therms of gas (including benzole) =	18 8 =	2.8
140 therms of coke and breeze 10 cwt. do. } = 140 × 1.6d. =	18 8 =	1.6
20 therms of tar 11 galls. do. ... ... } = 20 × 1.6d. =	2 8 =	1.6
240 therms of products =	40 0 =	2.0

The principle of "net weight" of coal substance consumed as propounded by Mr. Birks can also be used and the results would then appear as follows:

	s. d.	Pence per therm.
0.50 tons of coke and breeze (at coal price) ... =	20 0 =	1.71
0.05 tons of tar (at coal price) ... ... =	2 0 =	1.20
80 therms of gas (including benzole) (by diffce.) =	18 0 =	2.70
240 therms of products =	40 0 =	2.0

Each method will have its own appeal, but the price of each commodity will ultimately be determined by its "usefulness" to the community.

THE BEVERIDGE REPORT

ITS IMPLICATIONS IN THE GAS INDUSTRY

The Southern Association of Gas Engineers and Managers (Eastern District) discussed at a meeting at Gas Industry House on June 22 the Paper on "The Beveridge Report with Special Reference to Pension Funds and Workmen's Compensation," which Mr. H. Lesser (South Metropolitan Gas Company) presented at the annual meeting of the main Association on March 26, as published in the "JOURNAL" of April 7, 14, and 21, and reached the unanimous opinion that the Parliamentary Committee of the National Gas Council should study the Beveridge proposals with a view to seeing that the interests of the Gas Industry as a whole were safeguarded.

Mr. **J. M. Webber** (Croydon), who presided, recalled that when Mr. Lesser presented his Paper it was deemed impossible to do justice to it at the end of the routine business, and it was therefore arranged that the Western and Eastern Districts should consider the Paper at separate meetings. Mr. Lesser had already visited the Western District.

Mr. **Lesser** gave a general review of his Paper, and said it was important to see the specific proposals of the Beveridge Report against their true background. The schemes for pensions, workmen's compensation, sickness and unemployment benefits, and so forth were tributaries to the main stream of social welfare that was the inspiration of the Beveridge Plan. Sir William Beveridge had said he had invented a new type of human institution, and what he meant apparently was that he had in his scheme brought into play certain principles which were not in operation in any of the social services in any country of the world to-day. Coming to the implications of the report for the Gas Industry, Mr. Lesser pointed out that undertakings with their own pension funds would have to consider whether pensions should remain payable at 65, whether or not the recipients remained at work, and questions would arise as to what should be done with reserves which had been accumulated to meet pension liabilities. The present system of workmen's compensation was to go, and it was suggested that for the first 13 weeks of incapacity arising from accident the benefit to be paid should be the same as for ordinary illness, to be followed by an industrial pension at two-thirds of the ordinary earnings, with a maximum of £3 per week. For so-called hazardous industries there were to be set up statutory associations for the promotion of safety, promotion of measures for rehabilitation and re-employment, advice on making of regulations, and the collection of a special levy. Generally speaking there was to be a greater measure of control over employment. Unemployment benefit would be payable as of right only for six months, after which the insured person must be trained, and apparently if he was unwilling to leave his home and his ordinary responsibilities and his family according to the needs of his training he was to be subject to penalties. The proposals if adopted would have far-reaching effects, and it was important that Members of Parliament should be properly informed as to the views of the Industry, so that those views could be put plainly before the Government.

Lieut.-Colonel **F. J. Bywater** (President of the main Association) thanked Mr. Lesser for acceding to his request to give to responsible engineers and managers and leading citizens, through the Association, his views on the implications of what was after all a revolutionary proposal. He did not believe the Gas Industry would oppose the Beveridge Report, which in his opinion contained many excellent proposals, but it should seek to discourage the question being made a political issue, and take steps to discuss with other industries, through the F.B.I. or the Confederation of Employers' Organizations, the full implications of the Government proposals when these are known, and particularly to warn employees also of the effect which the Beveridge proposals, if implemented, would have on their own personal freedom of action. It was highly probable there would be some form of regionalization in the Gas Industry. Was it possible for them to take a lead as a public utility industry in saying to the Government that they were going to regionalize themselves and would like to take their part in this scheme, first of all putting their views forward, and then consolidating as an Industry their share in these proposals; in other words, that they should get together as an Industry and deal with the matter as an Industry?

Mr. **Lesser** said it would be lamentable if they talked about these things and did nothing about them. He could not help feeling that this question of social legislation was one for the national bodies to consider. It would be a thousand pities if, owing to the State taking over these matters and making provision for all kinds of contingencies, those domestic institutions which had done so much to bring employers and employees together in happy relationship had to disappear. It was really Industry's own fault that the State had now come to the conclusion that they were apathetic in this matter and would do nothing unless the State did it. When workmen's compensation came in, the South Metropolitan Gas Company contracted out and ran its own scheme. Later, when health insurance came in, provision was made for people to form their own societies, but very few gas undertakings did so, and yet it turned out to be a fine thing. When unemployment insurance came in it was provided that there should be industrial schemes, but very few people took any notice, and nobody except the South Metropolitan Gas Company adopted a supplementary scheme. The Government had more or less come to the conclusion that industrial units in the future were to be larger, and the Gas Industry had to look forward to larger units as the result of any schemes of reorganization. They ought, therefore, to come together; and if there was to be any large-scale legislation on the lines suggested in the Report, it would be well worth while for the national bodies to bring this question of social legislation under consideration, and to collect the views which arose from the wide and important experience of those connected with the Industry.

Mr. **G. L. Braidwood** (Southend) raised the question of the employment of casual labour in the Gas Industry in so far as the work was seasonal. The Industry would be responsible for the insurance and the benefits of such employees, and the scheme might be vitiated by a floating population of employees. If they had more business after the war they would employ more people, unless, of course, complete gasification reduced the number of workers. He was also interested in the question of directing men into other industries, and the fact that there might still be a greater demand at one time of the year than another.

Mr. **Lesser** said the South Metropolitan Company dealt with the casual labour problem a long time ago by arranging their summer and winter work in such a way as to spread it as evenly as possible through the seasons; it was a question of organization. Regulation of labour might depend on circumstances that varied in different parts of the country.

Mr. **D. C. Cross** (Lea Bridge) said that as one of the ordinary members he was extremely grateful for the information Mr. Lesser had given to them. Many men when talking about the State providing all the various benefits mentioned in the Beveridge Report overlooked the fact that they themselves were the State. Men were already complaining about the burden of income-tax, and were saying they were not getting a sufficiently high rate of pay to enable them to pay the high tax. The proposals were going to bring new complications. In his own Company he was up against the question of casual labour. Some of the men who through ill-health had had to be transferred to the yard had said they could not possibly pay their income-tax out of the lower rate of wages, and the tendency would be for the tax to go up still higher to pay for the greater benefits that were proposed in the Report. With regard to pensions, he wondered how gas undertakings were going to meet their obligations to those employees who were already covered; possibly new entrants would

For every size of works and every class of coal...

WEST'S

CARBONIZING PLANTS

GLOVER-WEST VERTICALS

WESTVERTICAL CHAMBERS

440 carbonizing plants have been built or are under construction by West's in 24 countries. Working results from a wide variety of gas coals have established the high efficiency and adaptability of the West systems.

WEST'S

GAS IMPROVEMENT CO · LTD ·

MILES PLATTING MANCHESTER 10

TELEPHONE—COLLYHURST 2961-2-3-4-5 TELEGRAMS—STOKER MANCHESTER

LONDON OFFICE: COLUMBIA HOUSE, ALDWYCH, W.C.2 TELEPHONE: HOLBORN 4108-9 TELEGRAMS: WESGASCO, ESTRAND

come under the new scheme. With regard to workmen's compensation, he wondered how they were going to prevent malingering when a man could draw £3 per week after 13 weeks' absence. He feared they were going to get a form of malingering that would undermine the morale of the working man. His works was operating under the Essential Work Order, and it was quite easy for any man to say that the "fumes" of the gas-works upset him. All he had to do was to get a doctor's certificate and immediately he was able to get a change of occupation.

Mr. **Lesser** said that with regard to obligations under existing pension schemes, provision was made in the Pensions Act of 1925 giving power to the managing body, notwithstanding any legal obligations, to adjust the pension, and some companies did so. He thought a much wider power would be needed in the light of the Beveridge plan. Sir William Beveridge had said in his Report that some small adjustments would undoubtedly be necessary, and they would take place over the transition period of 20 years. It was contemplated that there must be some adjustments which would be given Parliamentary authority under a new Act. With regard to malingering, that too was contemplated by Sir William Beveridge, who pointed out that the whole scheme depended for its success upon first having a health service that would involve a check on malingering, and he went on to say that there would be penalties for failure to comply with the decisions of the departmental authority, very much as there were now in regard to service pensions.

The **Chairman** asked if it was the wish of the meeting that a letter should be written to the National Gas Council impressing upon them that they should watch the interests of the Industry before the proposals became law and while there was still time to put their views forward.

It was formally agreed, on the proposition of Lieut.-Colonel **Bywater**, seconded by Mr. **Cross**, that the suggested communication should be sent to the National Gas Council after consultation between Mr. Lesser, the Hon. Secretary, and representatives of the Western District, in order that it could go forward as an expression of the opinion of the main Association.

A vote of thanks was accorded to Mr. Lesser, who briefly replied.

WAVERLEY ASSOCIATION OF GAS MANAGERS

Presidential Address*

of

WILLIAM M. HENDERSON,
Dalkeith

It would have been difficult to envisage the transport problems that we might have had to face and contend with throughout the past winter if there had been the cold of the past two winters. Our deliveries were somewhat irregular and erratic, but on the whole, other than during the months of November, December, and January, they managed to come up to our actual requirements. We have been warned by the Ministry to build up our deficiencies of stock with a view to meeting the still more restricted outputs.

In many cases those who found it necessary to carbonize a fairly high percentage of stock coal, especially that of a soft nature, such as was offered in the early days of the war for stocking purposes, must have experienced disastrous results, with lowering of manufacturing efficiency. This was pronounced in our case, where we had transport and stocking difficulties to contend with, necessitating undue handling of coal.

We may have sympathy with the coal industry at the present juncture. We appreciate the difficult circumstances brought about by wartime conditions. It appears to us to be an industry giving first place to output and price, rather than considering the essential requirements of our needs. We are dependent on what the coal industry gives us, and are at its mercy. In many cases we have been given coals entirely new to us, with resultant inefficiency in our production. Is there any likelihood of a continuance of this policy after the war? If so, let us start now by endeavouring to demand at least justice.

Coke

There are now no cluttered-up coke yards, no undercutting to procure a market. Coke has automatically sold itself, and has most assuredly come into its own as a suitable fuel for industry and domestic consumption alike, despite the variations resulting from the varying quality of coal retorted. Coke has found a rightful place in the fuel market, arising from the fact that it is the cheapest smokeless fuel that can be purchased, and we as an industry offer regular supplies of this commodity at the lowest price compatible with the state of the coal market, and at a moderate return upon the capital represented by its manufacture and distribution. What the future may hold for the coke market when coal has again been established free of the present wartime demand remains to be seen, and it can only be hoped that the formation of the Coke Association, which has not previously had the opportunity of operating in Scotland, may assist in complete disposal at reasonable prices to allow of a fair margin of profit.

It would seem for the present at least that our strength as an Industry lies in the manufacture of gas *cum* by-products and that coke is the necessary partner of gas, thereby assisting in the solution of the nation's fuel problems and adding to the general efficiency of the process of gas manufacture. This has been convincingly borne out in the "Fuel Expenditure Index."

Under the Ministry's scheme for recovering all the benzole possible in the interest of the nation's war effort many undertakings are finding the process a paying one, and where the declared quality of the gas and the process of manufacture are such that washing for this valuable wartime product is practicable, it should prove a source of additional revenue.

Maintenance and Replacement of Plant

In normal times the maintenance and depreciation of plant are closely allied. To-day circumstances are different, and undertakings' repair and maintenance are not always adequately considered, nor for that matter is the question of depreciation, due first to the great difficulty in securing materials required for repair and maintenance, and secondly to the shortage of labour to carry out this work. Should not repair and maintenance and replacement of plant from revenue give first place to the necessity of having to meet increased costs of primary materials, wages, taxation, and the general everyday running costs of the undertaking?

The overload demand put on plant capacity by wartime expediencies is another factor that should not be lost sight of, and if care is not exercised in avoiding an accumulation of repairs and maintenance for the post-war years, an undue demand may have to be faced. We hope this will not be the case, such as after the last war, when trying conditions of trade depression followed. This would bring in its trend bank overdraft in an endeavour to stabilize business—unless, of course, renewals can be charged to capital account, which should be kept as low as possible. Where companies have a regular annual depreciation fund or the possibilities of its creation, removal of this liability is certain, thereby avoiding an unfavourable balance-sheet and the curtailment of dividends.

Staffs have now been depleted to a minimum, and in many cases the running of the works and distribution has had to suffer. Under the latest man-power call-up of the National Services Act, many key-men both in the running of the undertaking and part of the Regional Gas Engineering Advisers' Mutual-Aid Scheme have been placed in their respective medical categories, with a view to being called. This, I believe, is generally agreed to have left the future efficient running of the undertakings concerned in a precarious position.

The replacement of horizontal retort stokers by female substitutes is not practicable in view of the strenuous nature of the work, in hand-charging and drawing, along with the excessive heat that must be endured. From time to time we have promises that these essential men will not be withdrawn, and it can only be hoped that the Ministry concerned will give the Industry the consideration it merits.

I feel that the Essential Work Order has to some extent gone a long way to making good some of the grievances that workmen have had in the past, and that in its broadest sense has brought to bear a common understanding between management and worker which is essential to the good running and harmony of the Industry.

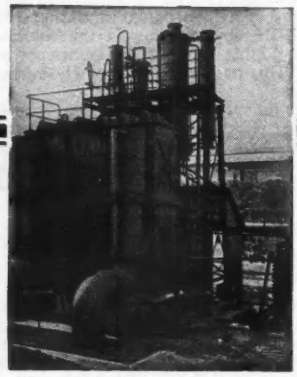
Every endeavour is still being made to continue the quarterly inspection of consumers' appliances and the follow-up of essential free maintenance, but at a time like this it must continue on only a limited scale, in view of the labour and material shortage. It can only be hoped that at this stage there will not be an undue build-up of a war-time heritage of appliance deterioration, upon which the future replacement is at present most obscure. It can well be imagined that the replacements after the war will be dependent on many factors that must follow the change-over period from war production to that of peace, such as the availability of the material and the power to purchase.

When we consider that £1,000,000 per annum was spent on propaganda by the gas and electricity industries prior to the war in direct opposition to each other in so-called peaceful competition, surely a peace pact was signed with the incoming of the Ministry of Fuel and Power. Each has its rightful place and useful purpose. Admittedly this should be to the best interests of the nation. It seems to me that this is the commencement of an understanding that may continue.

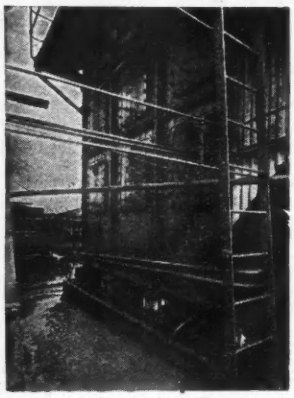
Is not the Gas Industry's rightful place in the scientific extraction from coal of its entire contents, of which gas may not necessarily be the most essential or important product for the future prosperity of the country?

Before terminating this Address, I desire on behalf of our Association to pay our highest respects and tributes to Dr. E. W. Smith, our retired Director of Gas Administration, and to assure him that we are most conscious and appreciative of the excellent work that he performed in the interests of our Industry during his term of office under the New Ministry. We must, unfortunately, at this time offer to him our heartfelt regrets that he could not see the possibility of continuing in office at this period of great moment in our history, with the affairs of the Industry generally in the melting-pot, and especially with the feeling of support that was behind him, it having been fully realized that a great leader had come forward at a time when he was most required.

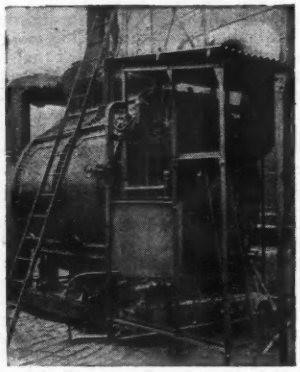
*Abstract.



" Permac " Joints in a Gas Works.



" Permac " Joints in a Gas Works.



" Permac " Joints in a Gas Works.

Permac

METAL-TO-METAL JOINTING MATERIAL

Ever since 1913 "PERMAC," the original Metal-to-Metal Jointing, has been holding up difficult joints like these in important Gas Works and on Coke Oven Plants all over the world. Equally suitable for any joint—steam, water, gas, oil—screw pipe or flange. Send for particulars.

Manufactured only by

Thomas & Bishop LTD.

(formerly of 37, Tabernacle Street, London, E.C. 2)

Temporary address:

39, Arthur Road, Wimbledon Park, London, S.W. 19

Products Prices—Stocks and Shares

The London Market July 12.

All Coal Tar Products are in good demand, and Pitch in the London area remains about 45s.

Attention is called to a new Government Order which has just been issued, the Control of Coal Tar Naphtha and Xylole Order, 1943 (S. R. & O. 1943, No. 768).

This new Order differs from the old 1942 Order mainly in the fact that it embraces the supply of these commodities in very small quantities.

Apart from this there is nothing of interest to report.

The Provinces July 12.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 1s. 10d., pure, 2s. 5d. (controlled by the Control of Toluene No. 2 Order, July 3, 1941, which fixes the maximum price at which this material may be sold). Naphtha and Xylole controlled by the Coal Tar Naphtha and Xylole Order, 1943, dated May 31 (S. R. & O., 1943, No. 768), operative from June 1. Carbolic acid, 60's, naphthalene, and anthracene controlled by the Coal Tar Products Prices Order S. R. & O. 2509, dated Dec. 1942, and operative from Jan. 1, 1943. Filter heavy oil (min. gr. 1,080), 7½d. to 8d. Creoso oil has been generally controlled as to directio and price for some time past. Current value fuel grades 5d. to 5½d.; timber preservati and other purposes 4½d. to 6d.

* In regard to pitch and crude tar prices we wou ask readers to refer to the editorial note on p. 396 the "JOURNAL" for Sept. 10, 1941.

Tar Products in Scotland July 10.

All products continue in large demand Refined tar controlled. Value is 4¼d. p gallon *ex* works, naked. Creosote oil: Spec fication oil, 6½d. to 7d.; low gravity, 7¼d. 7½d.; neutral oil, 6d. to 6½d.; hydrogenati oil, 5⅞d. per gallon; all *ex* works in bul Refined cresylic acid is active at 3s. 6d. 4s. 6d. per gallon *ex* works, naked, accordi to quality. Crude naphtha: 6½d. to 7d. p gallon. Solvent naphtha: Basic prices de vered in bulk, 90/180 grade 2s. 8d., and 90/1 Heavy naphtha, Unrectified, 1s. 10½d Rectified, 2s. 3d. per gallon. Pyridine: 90/1 grade, 13s., and 90/140 grade, 15s. per gallo

---

The firmness of British Funds was the chief feature on the Stock Exchange last week. Other sections were comparatively quiet, but the undertone remained firm.

There was no increase in the volume of business in the Gas Market, and it will be seen below that the number of price changes was smaller than for many weeks past. The principal movement was that of a rise of 12 points in Bournemouth 7% maximum stock to 152½ although a transaction was recorded early in the week at 143½ only. Prices in the Supplementary List closed unchanged, and the only movement in the Provinces was a gain of 2 in Sheffield consolidated.

Supplies of ordinary stocks are still very limited, but a number of small parcels of debenture issues are available, yielding betwee £3 16s. and £4 %.

The quotations of Weston-super-Mare co solidated and 4% debenture stock in la week's list should have read 103–106 an 99–101 respectively.

The following price changes occurred durin the week:

OFFICIAL LIST

Associated Gas & Water Deferred...	19/9—20/9	+-/3
Bournemouth 7 p.c. max.	150—155	+12
Severn Valley Gas Corporation Ord.	20/6—21/6	+-/6
South-Eastern Gas Corporation 4½ p.c. Red. Cum. Pref.	19/9—20/9	--/3

PROVINCIAL EXCHANGE

Sheffield Cons.	136—140	+2

TRADE CARDS

Arkon

INSTRUMENTS

Gas Flow Recorders and Indicators
Pressure and Vacuum Recorders and Indicators
Full Scale or Inclined Gauges

WALKER, CROSWELLER & CO. LTD.
CHELTENHAM, GLOS. Cheltenham 3172

R. LAIDLAW & SON (EDINBURGH) LTD.

Simon Square Works, Edinburgh 8. T/N 42842. T/A Laidlaw, Edinburgh. London: 2, Beaumont Road, Chiswick, W. 4.

"LAIDLAW" HIGH CAPACITY METERS give maximum capacity easily. Slots convertible for shilling or penny.

GOODALL, CLAYTON CO. LTD.
LEEDS.

Conveyors, Elevators, Bunkers, Roofs, Hoists, &c., Coal & Coke Screening and Sizing Plants, Retort Settings, Producers, Furnaces, Repairs.

MAVITTA DRAFTING MACHINES LTD.

Park Road, Aston, Birmingham. T/N East 0482. T/A Mavitta, Birmingham.

Machines for all Boards. Perfectly Balanced Tables. "Teantee" Blue-print Machines. ENTIRELY BRITISH.

HILMOR LTD.

Tube Bending Machines (Hand and Power). Tube Bending Specialists.

Temporary Offices: London Road, Knebworth, Herts. T/N Knebworth 3179.

We can supply machines for bending Gas and Steam Piping from ⅜ in. to 2 in. in the cold state.

M. B. WILD & CO. LTD.

Mechanical Engineers, Argyle Street, Birmingham 7. T/N East 0472.

CAPSTANS. BY-PRODUCTS COKE OVEN MACHINERY. ELEVATORS. CONVEYORS. WAGON TIPPLERS.